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## Test 1320: International 3588 and 6588 Diesel 16-Speed

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# NEBRASKA TRACTOR TEST 1320 — INTERNATIONAL 3588 DIESEL ALSO INTERNATIONAL 6588 DIESEL 16 SPEED

## POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption		Temperature °F (°C)				Barometer inch Hg (kPa)	
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb		
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1159 rpm)									
150.41 (112.16)	2400	9.590 (36.302)	0.446 (0.271)	15.68 (3.090)	189 (87.4)	64 (17.8)	75 (23.9)	28.820 (97.321)	
Standard Power Take-off Speed (1000 rpm)—One Hour									
152.07 (113.40)	2071	8.957 (33.906)	0.412 (0.251)	16.98 (3.345)	191 (88.6)	64 (17.9)	75 (24.0)	28.820 (97.321)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
131.35 (97.95)	2468	8.786 (33.258)	0.468 (0.285)	14.95 (2.945)	187 (86.1)	65 (18.3)	75 (23.9)	..... .....	
0.00 (0.00)	2650	3.279 (12.411)	..... .....	..... .....	180 (82.2)	65 (18.3)	75 (23.9)	..... .....	
68.44 (51.04)	2566	6.090 (23.053)	0.623 (0.379)	11.24 (2.214)	183 (83.9)	65 (18.3)	75 (23.9)	..... .....	
150.53 (112.25)	2400	9.566 (36.210)	0.445 (0.271)	15.74 (3.100)	192 (88.6)	66 (18.6)	76 (24.2)	..... .....	
34.81 (25.96)	2611	4.731 (17.910)	0.951 (0.579)	7.36 (1.449)	182 (83.3)	66 (18.9)	76 (24.2)	..... .....	
100.88 (75.23)	2522	7.423 (28.099)	0.515 (0.313)	13.59 (2.677)	186 (85.8)	66 (19.2)	76 (24.7)	..... .....	
Av Av	81.00 (60.40)	2536 (25.157)	6.646 (0.349)	0.574 (0.401)	12.19 (2.401)	185 (85.0)	66 (18.6)	75 (24.1)	28.817 (97.310)

## DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel gal/hr (l/h)	Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Temp. °F (°C) Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 8th (4LoDD) Gear											
126.15 (94.07)	7777 (34.59)	6.08 (9.79)	2402	2.50	9.607 (36.367)	0.533 (0.324)	13.13 (2.587)	190 (87.5)	67 (19.4)	72 (21.9)	28.915 (97.642)
75% of Pull at Maximum Power—Ten Hours 8th (4LoDD) Gear											
101.71 (75.84)	5994 (26.66)	6.36 (10.24)	2495	1.83	8.339 (31.568)	0.574 (0.349)	12.20 (2.403)	189 (87.3)	76 (24.7)	82 (27.7)	28.606 (96.598)
50% of Pull at Maximum Power—Two Hours 8th (4LoDD) Gear											
69.91 (52.13)	4012 (17.85)	6.53 (10.52)	2547	1.10	6.786 (25.687)	0.679 (0.413)	10.30 (2.029)	185 (85.0)	72 (21.9)	76 (24.2)	28.900 (97.591)
50% of Pull at Reduced Engine Speed—Two Hours 11th (2HiTA) Gear											
70.05 (52.24)	4011 (17.84)	6.55 (10.54)	1492	1.10	5.089 (19.265)	0.509 (0.309)	13.76 (2.712)	186 (85.6)	72 (22.2)	76 (24.2)	28.845 (97.405)
MAXIMUM POWER IN SELECTED GEARS											
99.32 (74.06)	17589 (78.24)	2.12 (3.41)	2499	10.60	2nd (1LoDD) Gear			185 (84.7)	67 (19.4)	68 (20.0)	28.750 (97.084)
123.86 (92.37)	16603 (73.85)	2.80 (4.50)	2401	8.38	3rd (2LoTA) Gear			189 (86.9)	63 (17.2)	66 (18.9)	28.940 (97.726)
126.74 (94.51)	14079 (62.63)	3.38 (5.43)	2400	5.49	4th (2LoDD) Gear			189 (86.9)	63 (17.2)	65 (18.3)	28.940 (97.726)
127.67 (95.21)	11074 (49.26)	4.32 (6.96)	2399	3.65	5th (3LoTA) Gear			189 (86.9)	63 (17.2)	65 (18.3)	28.940 (97.726)
127.26 (94.90)	9362 (41.65)	5.10 (8.20)	2400	3.00	6th (3LoDD) Gear			189 (87.2)	62 (16.7)	64 (17.8)	28.940 (97.726)
127.33 (94.95)	9226 (41.04)	5.18 (8.33)	2402	2.83	7th (4LoTA) Gear			188 (86.4)	62 (16.7)	64 (17.8)	28.940 (97.726)
129.46 (96.54)	7981 (35.50)	6.08 (9.79)	2401	2.41	8th (4LoDD) Gear			189 (87.2)	66 (18.9)	71 (21.7)	28.920 (97.659)
130.94 (97.64)	7387 (32.86)	6.65 (10.70)	2401	2.33	9th (1HiTA) Gear			189 (87.2)	64 (17.8)	67 (19.4)	28.940 (97.726)
130.07 (96.99)	6249 (27.80)	7.81 (12.56)	2401	1.91	10th (1HiDD) Gear			189 (87.2)	64 (17.8)	68 (20.0)	28.940 (97.726)

Department of Agricultural Engineering

Dates of Test: August 22 to 29, 1979

Manufacturer: INTERNATIONAL HARVESTER COMPANY, 401 North Michigan Avenue, Chicago, Illinois 60611.

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8407 **Fuel weight** 7.000 lbs/gal (0.839 kg/l) **Oil SAE 30 API service classification** SC/SE-CA/CD **To motor** 3.938 gal (14.905 l) **Drained from motor** 3.731 gal (14.122 l) **Transmission and final drive lubricant** I.H. HyTran Fluid **Total time engine was operated** 36.5 hours

**ENGINE:** Make International Diesel Type 6 cylinder vertical with turbocharger **Serial No.** 467TT2U090407\* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.300" × 5.350" (109.2 mm × 135.9 mm) **Compression ratio** 16.3 to 1 **Displacement** 466 cu in (7639 ml) **Cranking system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** underhood **Exhaust vertical** **Cooling medium temperature control** one thermostat

**CHASSIS:** Type four wheel drive **Serial No.** 2890007U9649\* **Tread width** rear 59.8" (1519 mm) to 104" (2642 mm) front 59.8" (1519 mm) to 104" (2642 mm) **Wheel base** 110" (2794 mm) **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 60.8" (1545 mm) Vertical distance above roadway 41.5" (1055 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph (km/h)** first 1.8 (3.0) second 2.2 (3.5) third 2.9 (4.7) fourth 3.4 (5.5) fifth 4.3 (6.9) sixth 5.0 (8.0) seventh 5.1 (8.1) eighth 5.9 (9.5) ninth 6.5 (10.4) tenth 7.6 (12.2) eleventh 10.1 (16.3) twelfth 11.9 (19.7) thirteenth 14.9 (24.0) fourteenth 17.4 (28.1) fifteenth 17.7 (28.4) sixteenth 20.7 (33.3) reverse 3.2 (5.1), 3.7 (6.0), 5.0 (8.0), 5.8 (9.4), 7.3 (11.8), 8.6 (13.8), 8.7 (14.0), 10.2 (16.4) **Clutch** single dry disc operated by foot pedal with hydraulic power assist **Brakes** multiple wet disc hydraulically power actuated and operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 194.4" (4.49 m) left 194.4" (4.94 m) **Turning space diameter** (on concrete surface without brake) right 432.2" (10.98 m) left 432.2" (10.98 m) **Power take-off** 1000 rpm at 2071 engine rpm.

### LUGGING ABILITY IN 8th (4LoDD) GEAR

Crankshaft Speed rpm	2401	2163	1921	1677	1438	1200
Pull—lbs (kN)	7981 (35.50)	9225 (41.03)	9727 (43.27)	10367 (46.11)	9675 (43.04)	8702 (38.71)
Increase in Pull %	0	16	22	30	21	9
Power—Hp (kW)	129.46 (96.54)	134.12 (100.01)	125.34 (93.47)	116.28 (86.71)	93.29 (69.57)	70.28 (52.41)
Speed—Mph (km/h)	6.08 (9.79)	5.45 (8.77)	4.83 (7.78)	4.21 (6.77)	3.62 (5.82)	3.03 (4.87)
Slip %	2.41	2.91	3.24	3.57	3.24	2.75

### TRACTOR SOUND LEVEL WITH CAB dB(A)

Maximum Available Power—Two Hours	78.5
75% of Pull at Maximum Power—Ten Hours	79.0
50% of Pull at Maximum Power—Two Hours	78.5
50% of Pull at Reduced Engine Speed—Two Hours	76.0
Bystander in 15th (4HiTA) gear	88.5

### TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
<b>Rear Tires</b>	—No., size, ply & psi (kPa)	Two 18.4R38; 8; 16 (110)	Two 18.4R38; 8; 16 (110)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	572 lb (260 kg)	None
<b>Front Tires</b>	—No., size, ply & psi (kPa)	Two 18.4R38; 8; 16 (110)	Two 18.4R38; 8; 16 (110)
Ballast	—Liquid (each)	None	None
	—Test Equipment (each)	62 lb (28 kg)	None
<b>Height of Drawbar</b>		20 in (510 mm)	20 in (510 mm)
<b>Static Weight with Operator—Rear</b>		9080 lb (4119 kg)	7935 lb (3599 kg)
Front		9810 lb (4450 kg)	9685 lb (4393 kg)
Total		18890 lb (8569 kg)	17620 lb (7992 kg)

**REPAIRS and ADJUSTMENTS:** No repairs or adjustments.

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 164°F (73.2°C). Nine gears were chosen between 15% slip and 10 mph (16.1 km/h). The pull in 2nd (1LoDD) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1320**.

LOUIS I. LEVITICUS

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



**International 3588 Diesel**